

New Patent Claims:

1. A molding with synthetic polymer surfaces which have self-cleaning properties and have surface structures with elevations,
5 characterized in that
the elevations are formed by particles which have been securely bonded to the synthetic polymer surface and which have hydrophobic properties, the
10 particles having been bonded directly into the synthetic polymer surface, rather than having been bonded by way of carrier systems or the like.
2. The molding as claimed in claim 1,
15 characterized in that
the elevations have an average height of from 50 nm to 25 μm and an average separation of from 50 nm to 25 μm .
- 20 3. The molding as claimed in claim 1 or 2,
characterized in that
the elevations have an average height of from 50 nm to 4 μm and/or an average separation of from 50 nm to 4 μm .
- 25 4. The molding as claimed in any of claims 1 to 3,
characterized in that
the elevations have an aspect ratio of from 0.5 to 20.
- 30 5. The molding as claimed in claim 4,
characterized in that
the elevations have an aspect ratio of from 1 to 10.
- 35 6. The molding as claimed in any of claims 1 to 5,
characterized in that

the elevations have been applied to the inner surface of the moldings.

7. The molding as claimed in any of claims 1 to 6,
5 characterized in that
the elevations have been applied to the outer surface of the moldings.

8. The molding as claimed in any of claims 1 to 7,
10 characterized in that
the synthetic polymer surface of the moldings comprises a material selected from poly(trifluoroethylene), poly(vinylidene fluoride), poly(chlorotrifluoroethylene), poly(hexafluoropropylene),
15 poly(perfluoropropylene oxide), poly(fluoroalkyl acrylate), poly(fluoroalkyl methacrylate), poly(vinyl perfluoroalkyl ether), or comprises other polymers from perfluoroalkoxy compounds, poly(isobutene), poly(4-methyl-1-pentene),
20 polycarbonates, poly(meth)acrylates, polyamides, PVC, polyethylenes, polypropylenes, aliphatic linear or branched alkenes, cyclic alkenes, polystyrenes, polyesters, polyether sulfones, polyacrylonitrile, or polyalkylene terephthalates,
25 and polynorbornene, in the form of homo- or copolymer, or comprises a mixture of these.

9. The molding as claimed in any of claims 1 to 8,
characterized in that
30 the surface of the particles has an irregular fine structure in the nanometer range.

10. The molding as claimed in at least one of claims 1 to 9,
35 characterized in that
the moldings comprise particles selected from silicates, minerals, metal oxides, metal powders, silicas, pigments, or polymers.

11. The molding as claimed in at least one of claims 1 to 10,

characterized in that

5 the moldings comprise particles selected from fumed silicas, precipitated silicas, aluminum oxide, silicon oxide, doped silicates, fumed silicates, or pulverulent polymers.

10 12. A process for producing moldings with surfaces, all or part of which have elevations, characterized in that

a surface of the moldings which is swollen by a swelling agent is treated with this swelling agent, where the swelling agent comprises 15 undissolved particles having hydrophobic properties, and after removal of the swelling agent and drying at least some of the particles are securely bonded to the surface of the 20 moldings.

13. The process as claimed in claim 12, characterized in that

25 the particles have been suspended in the swelling agent.

14. The process as claimed in claim 12 or 13, characterized in that

30 the surface which is solvated by a swelling agent comprises polymers based on polycarbonates, on poly(meth)acrylates, on polyamides, on PVC, on polyethylenes, on polypropylenes, on aliphatic linear or branched alkenes, on cyclic alkenes, on 35 polystyrenes, on polyesters, on polyether sulfones, on polyacrylonitrile, or on polyalkylene terephthalates, or else comprises their mixtures or copolymers.

15. The process as claimed in at least one of claims 12 to 14,

characterized in that

5 the swelling agent used comprises at least one compound suitable as a swelling agent for the appropriate surface and selected from the group of the alcohols, the glycols, the ethers, the glycol ethers, the ketones, the esters, the amides, the nitro compounds, the halogenated hydrocarbons, and
10 the aliphatic and aromatic hydrocarbons, or a mixture of these.

16. The process as claimed in claim 15,

characterized in that

15 the swelling agent used comprises at least one compound suitable as a swelling agent for the appropriate surface and selected from methanol, ethanol, propanol, butanol, octanol, cyclohexanol, phenol, cresol, ethylene glycol, diethylene glycol, diethyl ether, dibutyl ether, anisole,
20 dioxane, dioxolane, tetrahydrofuran, monoethylene glycol ether, diethylene glycol ether, triethylene glycol ether, polyethylene glycol ether, acetone, butanone, cyclohexanone, ethyl acetate, butyl acetate, isoamyl acetate, ethylhexyl acetate, glycol ester, dimethylformamide, pyridine, N-methylpyrrolidone, N-methylcaprolactone, acetonitrile, carbon disulfide, dimethyl sulfoxide, sulfolane, nitrobenzene,
25 dichloromethane, chloroform, carbon tetrachloride, trichloroethene, tetrachloroethene, 1,2-dichloroethane, and chlorophenol, or comprises (hydro)chlorofluorocarbons, petroleum spirits, petroleum ether, cyclohexane, methylcyclohexane, decalin, tetralin, terpenes,
30 hexafluoroisopropanol, benzene, toluene, and xylene, or a mixture of these.

17. The process as claimed in at least one of claims
12 to 16,

characterized in that

5 the swelling agent which comprises the particles
has a temperature of from -30°C to 150°C,
preferably from 15 to 100°C, prior to application
to the surface.

18. The process as claimed in at least one of claims

10 12 to 17,

characterized in that

the swelling agent comprises particles which have
an average particle diameter of from 0.02 to
15 100 µm.

19. The process as claimed in claim 18,

characterized in that

the swelling agent comprises particles which have
an average particle diameter of from 0.1 to 30 µm.

20. The process as claimed in at least one of claims

12 to 19,

characterized in that

25 the swelling agent comprises particles selected
from silicates, minerals, metal oxides, metal
powders, silicas, pigments, or polymers.

21. The process as claimed in at least one of claims

12 to 20,

30 characterized in that

the particles have hydrophobic properties by
virtue of treatment with a suitable compound.

22. The process as claimed in claim 21,

35 characterized in that

the particles are provided with hydrophobic
properties prior to or after bonding to the
surface.

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O.Z. 5974-WO

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23. A vessel with a synthetic polymer surface which has self-cleaning properties and has surface structures with elevations, the production process being as claimed in any of claims 12 to 22.
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24. A textile with a synthetic polymer surface which has self-cleaning properties and has surface structures with elevations, the production process being as claimed in any of claims 12 to 22.
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